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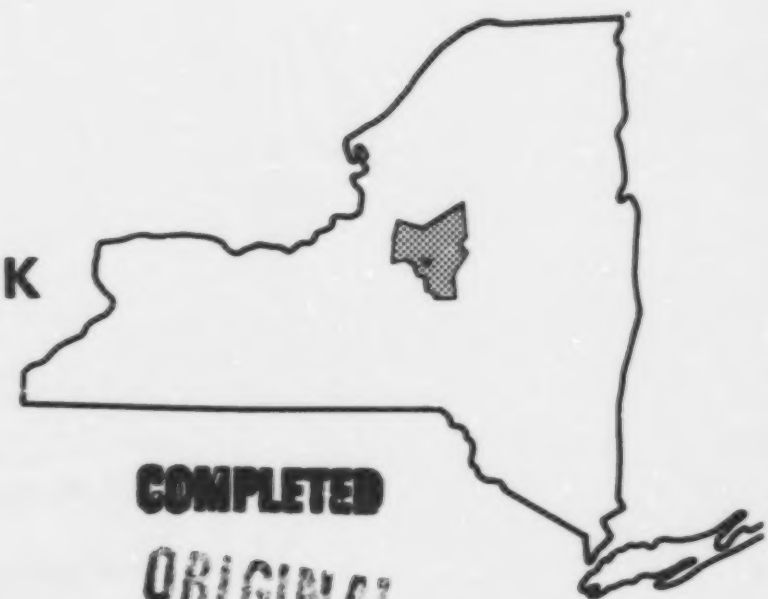
FLOOD INSURANCE STUDY

VILLAGE OF VERNON, NEW YORK
ONEIDA COUNTY



COMPLETED
ORIGINAL

APRIL 15, 1988

Federal Emergency Management Agency

COMMUNITY NUMBER - 360560

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance study purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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FLOOD INSURANCE STUDY
VILLAGE OF VERNON, ONEIDA COUNTY, NEW YORK

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Village of Vernon, Oneida County, New York, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were prepared by Edwards and Kelcey Engineers, Inc., for the Federal Emergency Management Agency (FEMA), under Contract No. EMW-C-1604. This work was completed in October 1986.

1.3 Coordination

On February 8, 1984, an initial Consultation and Coordination Officer's (CCO) meeting, attended by representatives of FEMA, the village, and Edwards and Kelcey Engineers, Inc. (the study contractor), was held to identify the streams to be studied by detailed methods. During the course of the study, a search for basic data was made at all levels of government. An intermediate CCO meeting was held on June 4, 1986, with officials of the village to present preliminary results. On March 11, 1987, the results of the study were reviewed at a final CCO meeting attended by representatives of FEMA, the village, and the study contractor.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Village of Vernon, Oneida County, New York. The area of study is shown on the Vicinity Map (Figure 1).

Sconondoa Creek was studied by detailed methods for its entire length within the community. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction through October 1991.

2.2 Community Description

The Village of Vernon is located in south-central Oneida County, New York. It is completely surrounded by the Town of Vernon. The total land area contained within the corporate limits of the village is approximately 0.9 square mile. The 1980 population was 1,373, an increase of 265 over the 1970 population of 1,108 and an increase of 460 over the 1960 population of 913 (Reference 1).

Sconondoa Creek, which flows northwest through the village, originates in the Town of Augusta, approximately 4 miles south of the village. Its drainage area encompasses 34.1 square miles at the downstream corporate limits.

Approximately 40 percent of the village has been developed, with the remainder of land being vacant or wooded. Within the floodplains studied, development is limited to single-family residences and a few private businesses. The majority of development is adjacent to State Routes 5 and 234, and County Routes 25, 23, and 81.

The climate in central New York is characterized by warm summers, cold winters, and moderate to heavy snowfall. Mean daily temperatures range from 24 degrees Fahrenheit (^{o}F) in January to 72^{o}F in July. The average annual precipitation is 39 inches of which 19 inches become runoff (Reference 2).

2.3 Principal Flood Problems

Flooding along Sconondoa Creek has been a recurrent problem. There is very little retention capacity in the basin, and the creek is subjected to flash floods and ice jamming. On June 22, 1972, a major flood occurred causing extensive damage to residential and commercial areas of the Oswego River Basin (Reference 3).

2.4 Flood Protection Measures

There are no flood protection facilities along Sconondoa Creek in the Village of Vernon and none are planned for installation.

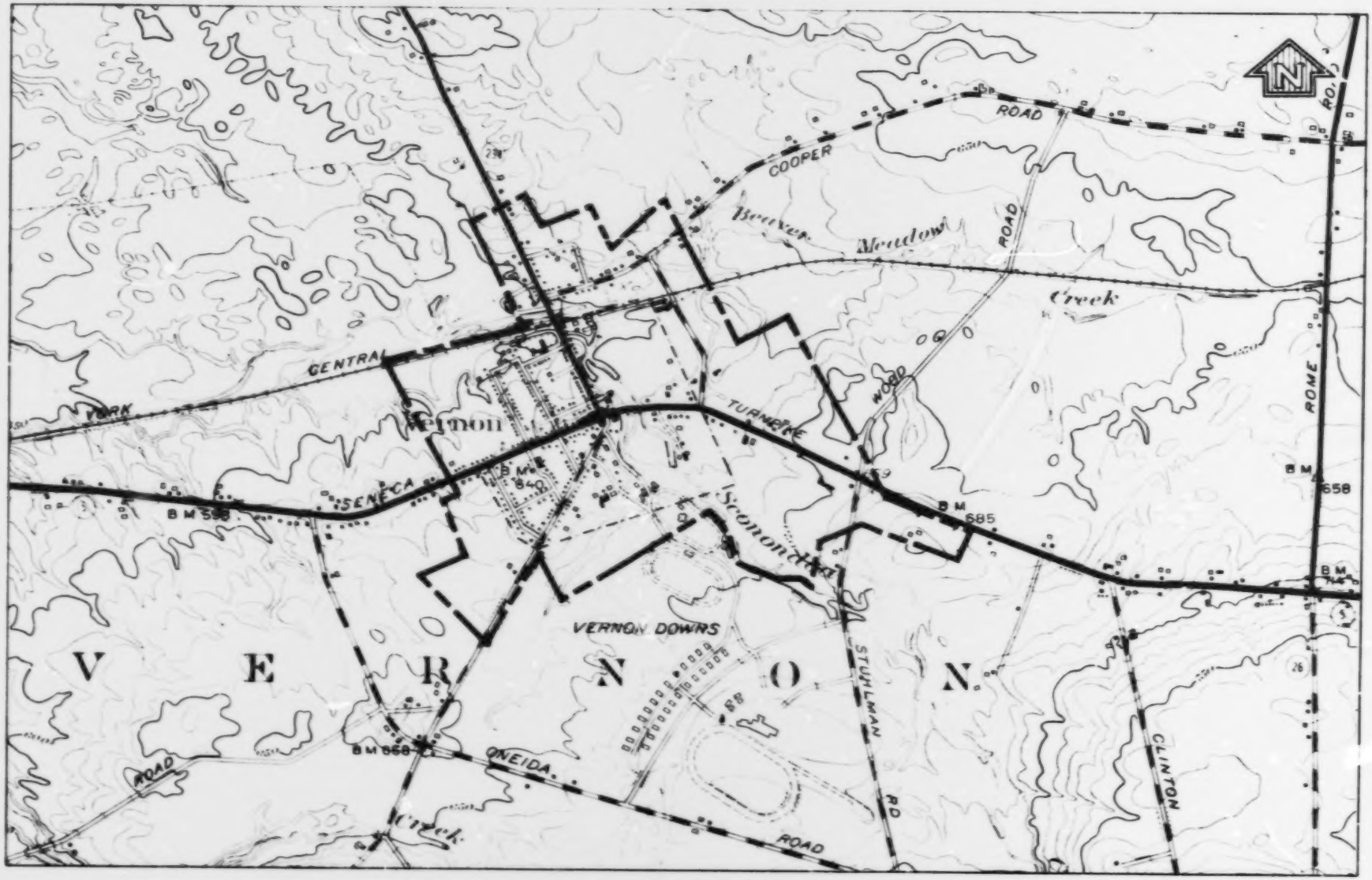

FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF VERNON, NY

(ONEIDA CO.)

APPROXIMATE SCALE

2000 0 2000 4000 8000 FEET

VICINITY MAP

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Non-structural measures of flood protection are currently utilized to aid in the prevention of future flooding. The community currently adheres to and implements the minimum standards as set forth in the Flood Insurance Program.

3.0 ENGINEERING METHODS

For the flooding source studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for the flooding source studied in detail affecting the community.

The hydrologic analysis for Sconondoa Creek followed a procedure in the U. S. Geological Survey (USGS) publication Techniques for Estimating Magnitude and Frequency of Floods on Rural Unregulated Streams in New York State Excluding Long Island (Reference 4). This procedure relates drainage area and storage percent to a series of regression equations for the western region. Discharges were computed for specific recurrence intervals by substituting the applicable values into the corresponding regression equations.

A summary of the drainage area-peak discharge relationships for Sconondoa Creek is shown in Table 1, "Summary of Discharges."

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the source studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
SCONONDOA CREEK					
At downstream corporate limits	34.1	2,693	4,201	4,971	7,100
At upstream corporate limits	28.1	2,615	4,166	4,969	7,000

Cross sections for the backwater analyses of Sconondoa Creek were obtained from aerial photographs at a scale of 1:6,000 (Reference 5). The below-water sections were obtained by field measurement. All bridges, dams, and culverts were field surveyed to obtain elevation data and structural geometry.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the Flood Insurance Rate Map (Exhibit 2).

Water-surface elevations of floods of the selected recurrence intervals were computed using the COE HEC-2 step-backwater computer program (Reference 6). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals. This computer model was calibrated using historic floodwater marks primarily from the flood of June 22, 1972. Starting water-surface elevations for Sconondoa Creek were calculated using the slope/area method.

Roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and based on field observations of the stream and floodplain areas. The channel "n" values for Sconondoa Creek ranged from 0.022 to 0.030, and the overbank "n" value was 0.070.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps; the descriptions of the marks are presented in Elevation Reference Marks (Exhibit 3).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For the stream studied in detail, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:4,800 with a contour interval of 4 feet (Reference 7).

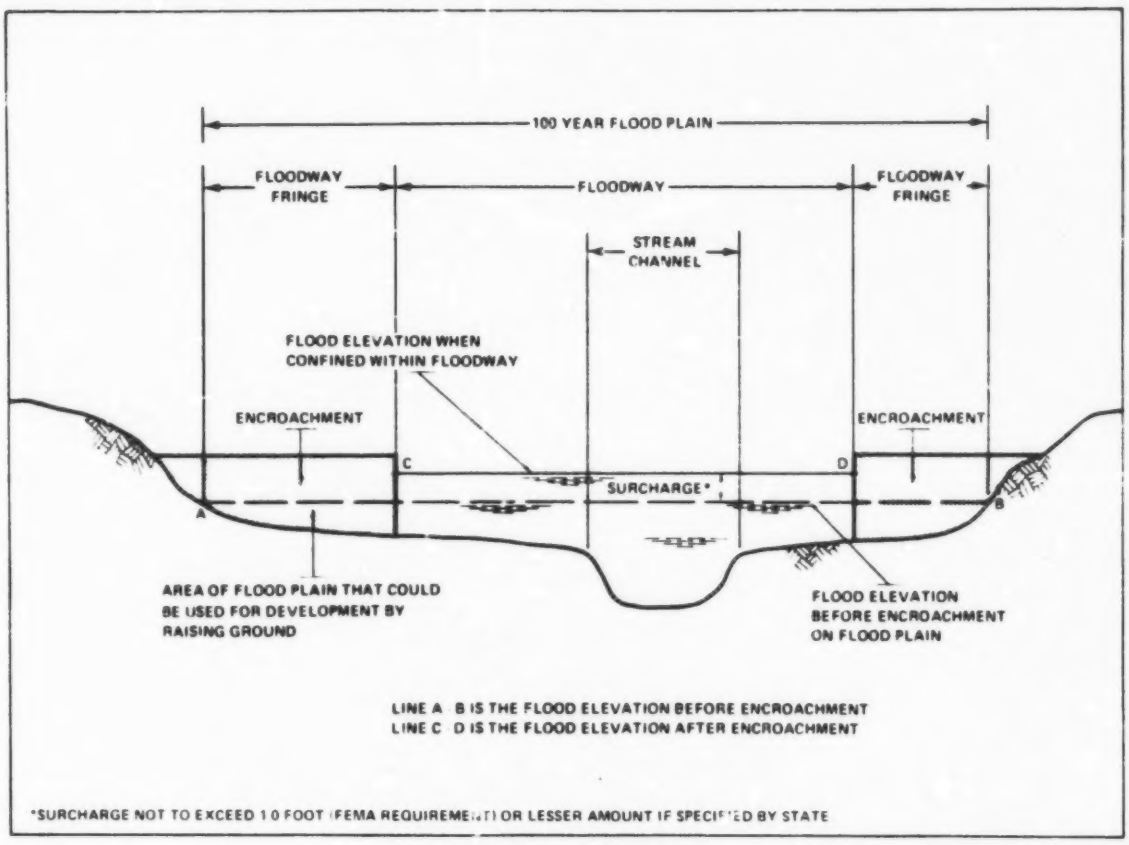
The 100- and 500-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zone AE), and the 500-year floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodway in this study is presented to local agencies as a minimum standard that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodway presented in this study was computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (Table 2). The computed floodway is shown on the Flood Insurance Rate Map (Exhibit 2). In cases where the floodway and 100-year floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.


100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE

FLOODWAY SCHEMATIC Figure 2

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Sconondoa Creek								
A	290	51	350	14.2	592.2	592.2	592.6	0.4
B	2,995	86	630	7.9	612.8	612.8	612.8	0.0

[1]Feet above corporate limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF VERNON, NY
(ONEIDA CO.)

FLOODWAY DATA

SCONONDOA CREEK

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5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100- and 500-year floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable.

7.0 OTHER STUDIES

A Flood Insurance Study is currently being prepared for the Town of Vernon (Reference 8). The results of that study will be in exact agreement with the results of this study.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, the Natural and Technological Hazards Division, 26 Federal Plaza, Room 1351, New York, New York 10278.

9.0 BIBLIOGRAPHY AND REFERENCES

1. U. S. Department of Commerce, Bureau of the Census, 1980 Census of Population, Characteristics of the Population, Number of Inhabitants, New York, Washington, D. C., U. S. Government Printing Office, February 1982.

2. U. S. Department of Commerce, National Oceanic and Atmospheric Administration, Climatological Data, Annual Summary, Asheville, North Carolina, National Climatic Center, 1976.

3. Rome Daily Sentinel, Volume 91, Rome, New York, June 22, 1972.

4. U. S. Department of the Interior, Geological Survey, Water Resources Investigations 79-83, Techniques for Estimating Magnitude and Frequency of Floods on Rural Unregulated Streams in New York State Excluding Long Island, Albany, New York, July 1979.

5. Konski Engineers, P. C., of Syracuse, New York, Aerial Photographs, Scale 1:6,000: Vernon, New York, December 1984.

6. U. S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Generalized Computer Program, Davis, California, October 1973, Updated February 1977.

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8. Federal Emergency Management Agency, Flood Insurance Study, Town of Vernon, Oneida County, New York (Unpublished).

Brater, Ernest F., and Horace Williams King, Handbook of Hydraulics, Sixth Edition, New York, McGraw-Hill, 1976.

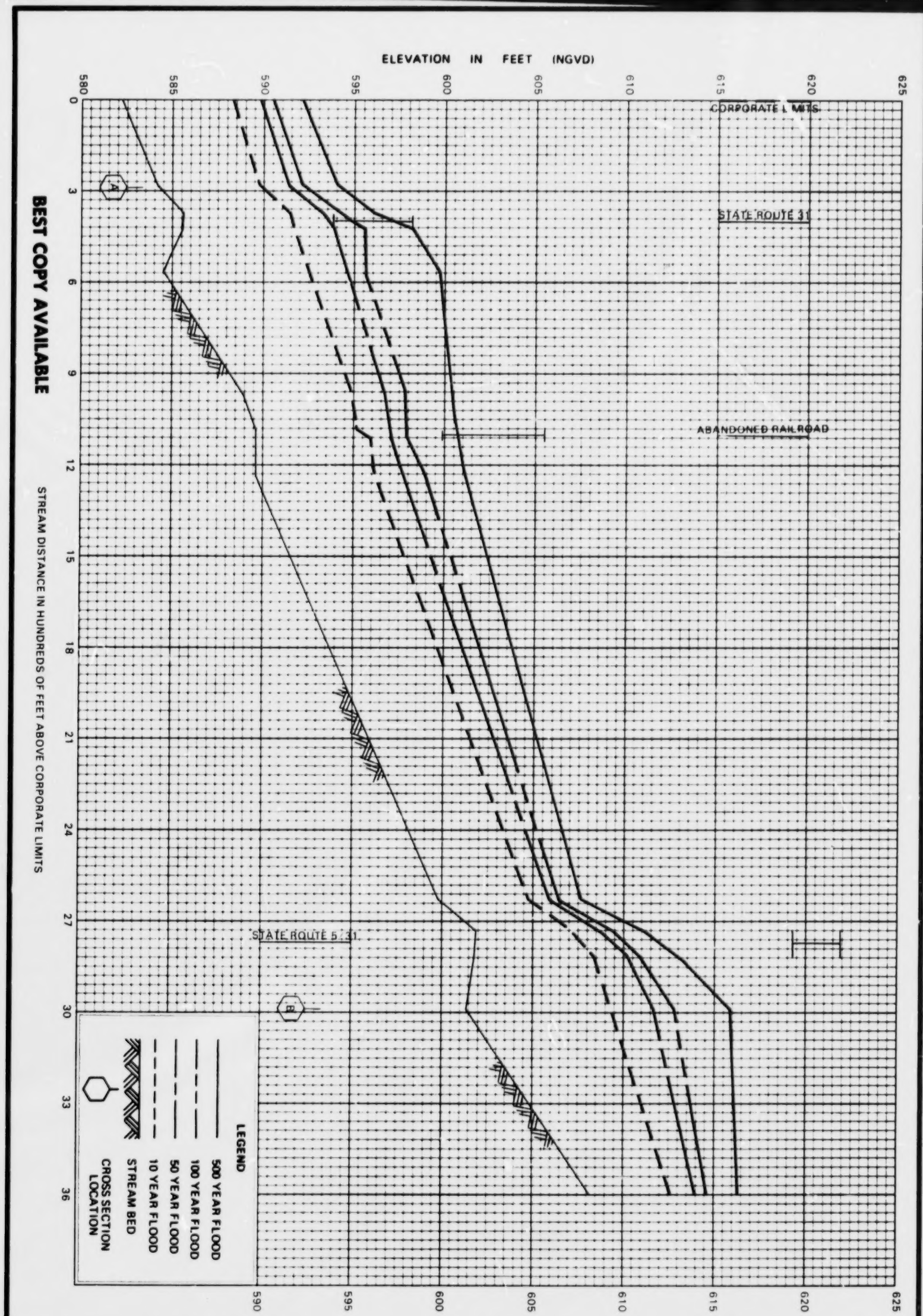
Chow, Ven Te, Open-Channel Hydraulics, New York, McGraw-Hill, 1959.

New York State Department of Transportation, Transportation/Planning Map, Scale 1:250,000, 1974.

U. S. Army Corps of Engineers, Hydrologic Engineering Center, Application of the HEC-2 Bridge Routines, Training Document No. 6, Davis, California, June 1974.

EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	Elevation (Feet NGVD)	Description of Location
RM 1	621.7	Chiseled square in south corner top of southeast wing wall of State Routes 5 and 31 bridge over Sconondoa Creek.



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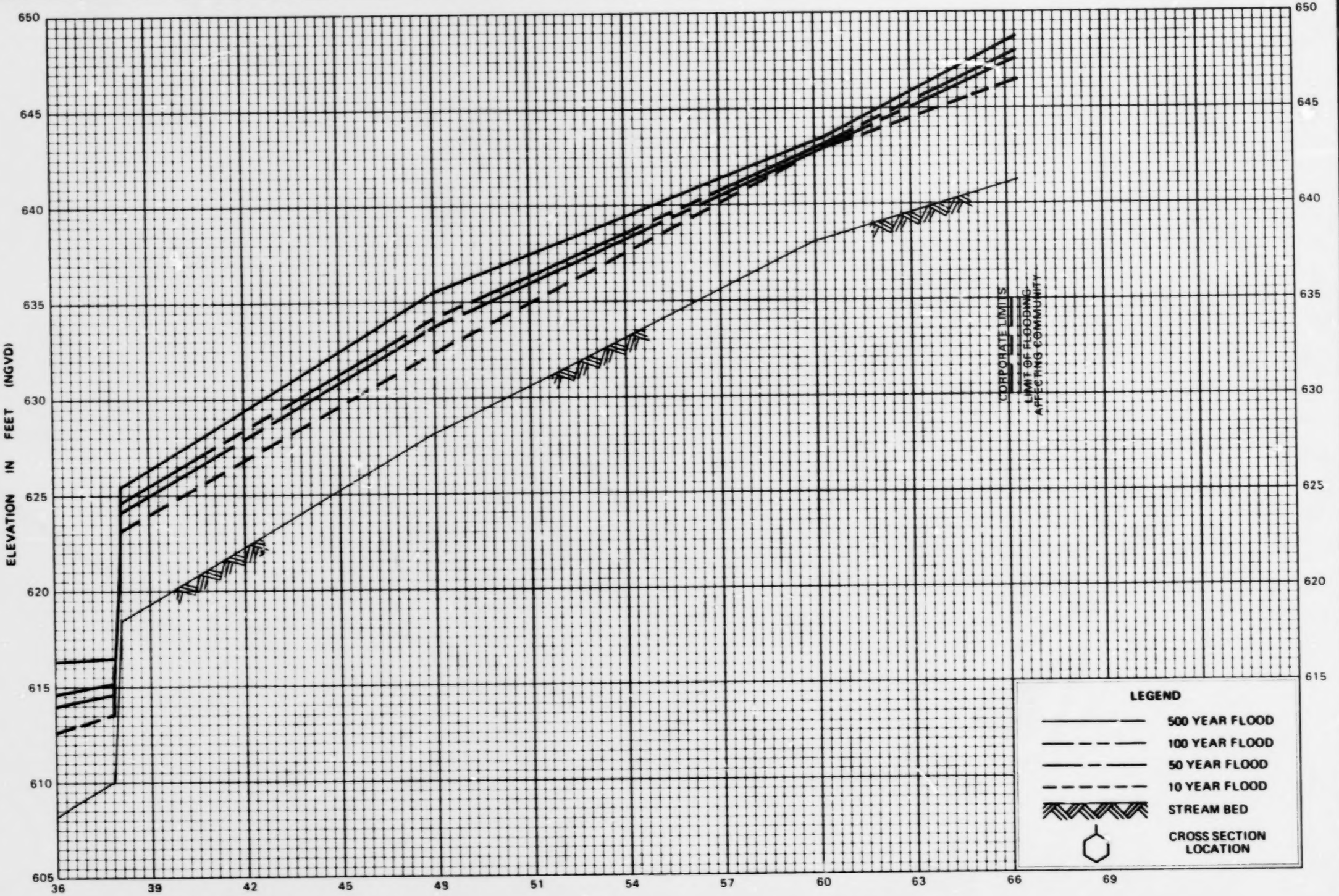
01P	FEDERAL EMERGENCY MANAGEMENT AGENCY VILLAGE OF VERNON, NY (ONEIDA CO.)	FLOOD PROFILES SCONONDOA CREEK



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FLOOD PROFILES

SCONONDOA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF VERNON, NY

(ONEIDA CO.)

02P